CIVIL AIM CONSULTANTS & ENGINEERS
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An ISO 9001-2015 Certified Company
NABL Accredited As Per ISO/IEC 17025:2017 Laboratory

Job No: CACE/BBMP/MSV/W.No.14/2021-22 Date: **30.03.2022**

TEST REPORT ON PAVING BITUMEN

Client	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	M/S **M S V Construction Company,** Contractor, Bangalore.
Name of work	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
BIS Code	IS 73:2013,IS 1203:1978, IS 1208:1978, IS 1205:1978, IS1448(P-69):1969
Date of Testing	**30.03.2022**
Type of Mix	**Dense Graded Bituminous Macadam , VG 30**
Source of Location	**Hot Mix Plant**

The results of the tests conducted on the bitumen sample using for Dense Graded Bituminous Macadam

Sl.No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 0C, 100gms, 5sec, 1/10 mm	50	Min 45
2	Softening point, 0C	48	Min 47
3	Ductility at 250C, cm	>98	Min40
4	Flash Point, 0C	275	Min 220

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For CIVIL AIM CONSULTANTS & ENGINEERS

Authorised Signatory

No. 01, Satvika Nilaya, Opp. Widia Poorna Prajna School,
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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date: 01.04.2022

Specific Gravity And Water Absorption Test

Client	**Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**M/S M S V Construction Company, Contractor, Bangalore.**
Name of the Work	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
BIS Code	IS 2386(Part 3):1963
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	30.03.2022 to 01.04.2022

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2021	2023	2025	
2	Weight of basket suspended in water	W_2 g	757	758	756	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1264	1265	1269	
4	Weight of saturated surface dry aggregate in air	W_3 g	2017	2016	2015	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	753	751	746	
6	Weight of oven dried aggregate	W_4 g	2007	2007	2005	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.665	2.672	2.688	2.675
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.701	2.705	2.724	2.710
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.50%	0.45%	0.50%	0.48%

Comments:

→ Maximum allowable Aggregate Water absorption value for Dense Graded Bituminous Macadam is 2.0%(As per MORTH table 500.8)

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date: 04.04.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company,** Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	04.04.2022

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.26	10.06	9 Kn (min)
2	Marshal flow, mm	3.67	3.75	2 – 4
3	Percent air voids in Mineral Aggregate	13.77	14.30	13 – 15
4	Voids in Compacted Mix	3.80	4.22	3 – 6
5	Percent Voids filled with Bitumen	68.89	69.55	65 - 75
6	Density, g/cc	2.23	2.27	--

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Date: 04.04.2022

Job No.: CACE/BBMP/MSV/W.No.14/2021-22

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer**, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company**, Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	04.04.2022

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	**Description**	**Test Result 1**	**Test Result 2**	**Requirement as per MORTH (Table 500-19)**
1	Marshal Stability, Kn	9.25	10.12	9 Kn (min)
2	Marshal flow, mm	3.68	4.51	2 – 4
3	Percent air voids in Mineral Aggregate	13.79	14.35	13 – 15
4	Voids in Compacted Mix	3.84	4.26	3 – 6
5	Percent Voids filled with Bitumen	68.91	69.57	65 - 75
6	Density, g/cc	2.25	2.27	--

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22

Date: 05.04.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer**, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company**, Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	05.04.2022

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.32	10.19	9 Kn (min)
2	Marshal flow, mm	3.75	3.83	2 – 4
3	Percent air voids in Mineral Aggregate	13.86	14.42	13 – 15
4	Voids in Compacted Mix	3.90	4.33	3 – 6
5	Percent Voids filled with Bitumen	68.97	69.63	65 - 75
6	Density, g/cc	2.25	2.26	--

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date: 05.04.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company,** Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	05.04.2022

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.22	10.09	9 Kn (min)
2	Marshal flow, mm	3.65	3.91	2 – 4
3	Percent air voids in Mineral Aggregate	13.76	14.32	13 – 15
4	Voids in Compacted Mix	3.81	4.23	3 – 6
5	Percent Voids filled with Bitumen	68.88	69.54	65 - 75
6	Density, g/cc	2.23	2.24	--

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date: 04.04.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX
AASHTO T 164 & AASHTO T 30

Client	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore
Agency	M/S M S V Construction Company, Contractor, Bangalore.
Name of the Work	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Date of Testing	04.04.2022

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	476.5	477
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	23.50	23.00
7. Bitumen content in %	4.70	4.60
8. Average	**4.65**	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	34.7	34.7	7.3	92.7	90 - 100
19	74.1	108.8	22.8	77.2	71 - 95
13.2	65.1	173.9	36.5	63.5	56 - 80
4.75	84.3	258.2	54.2	45.8	38 - 54
2.360	76.5	334.7	70.2	29.8	28 - 42
0.300	96.1	430.8	90.4	9.6	7 - 21
0.075	21.1	451.9	94.8	5.2	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	36.6	36.6	7.7	92.3	90 - 100
19	73.2	109.8	23.0	77.0	71 - 95
13.2	66.9	176.7	37.0	63.0	56 - 80
4.75	83.50	260.2	54.5	45.5	38 - 54
2.360	78.9	339.1	71.1	28.9	28 - 42
0.300	98.9	438	91.8	8.2	7 - 21
0.075	22.3	460.3	96.5	3.5	2 - 8

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22

Date: 04.04.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX

AASHTO T 164 & AASHTO T 30

Client	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore
Agency	M/S M S V Construction Company, Contractor, Bangalore.
Name of the Work	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Date of Testing	04.04.2022

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477	477
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	23.00	23.00
7. Bitumen content in %	4.60	4.60
8. Average	4.60	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	35.9	35.9	7.5	92.5	90 - 100
19	72.9	108.8	22.8	77.2	71 - 95
13.2	66.8	175.6	36.8	63.2	56 - 80
4.75	83.8	259.4	54.4	45.6	38 - 54
2.360	76.5	335.9	70.4	29.6	28 - 42
0.300	96.2	432.1	90.6	9.4	7 - 21
0.075	21.2	453.3	95.0	5.0	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	36.6	36.6	7.7	92.3	90 - 100
19	73.2	109.8	23.0	77.0	71 - 95
13.2	66.1	175.9	36.9	63.1	56 - 80
4.75	83.50	259.4	54.4	45.6	38 - 54
2.360	78.2	337.6	70.8	29.2	28 - 42
0.300	91.2	428.8	89.9	10.1	7 - 21
0.075	21.2	450	94.3	5.7	2 - 8

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date: 05.04.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX
AASHTO T 164 & AASHTO T 30

Client	**Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore**
Agency	**M/S M S V Construction Company, Contractor, Bangalore.**
Name of the Work	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Date of Testing	05.04.2022

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477.5	477.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	22.50	22.50
7. Bitumen content in %	4.50	4.50
8. Average	**4.50**	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	34.4	34.4	7.2	92.8	90 - 100
19	73.9	108.3	22.7	77.3	71 - 95
13.2	66	174.3	36.5	63.5	56 - 80
4.75	84	258.3	54.1	45.9	38 - 54
2.360	76	334.3	70.0	30.0	28 - 42
0.300	96.8	431.1	90.3	9.7	7 - 21
0.075	21.6	452.7	94.8	5.2	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	36.5	36.5	7.6	92.4	90 - 100
19	73.4	109.9	23.0	77.0	71 - 95
13.2	66.8	176.7	37.0	63.0	56 - 80
4.75	84.50	261.2	54.7	45.3	38 - 54
2.360	78.6	339.8	71.2	28.8	28 - 42
0.300	98.5	438.3	91.8	8.2	7 - 21
0.075	23.4	461.7	96.7	3.3	2 - 8

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date: 05.04.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX
AASHTO T 164 & AASHTO T 30

Client	**Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore**
Agency	**M/S M S V Construction Company, Contractor, Bangalore.**
Name of the Work	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Date of Testing	05.04.2022

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	476.5	477
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	
6. Weight of Bitumen Extracted, g. (corrected)	23.50	23.00
7. Bitumen content in %	4.70	4.60
8. Average	4.65	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	30.7	30.7	6.4	93.6	90 - 100
19	77.2	107.9	22.6	77.4	71 - 95
13.2	65.2	173.1	36.3	63.7	56 - 80
4.75	85.2	258.3	54.2	45.8	38 - 54
2.360	77.1	335.4	70.4	29.6	28 - 42
0.300	95.8	431.2	90.5	9.5	7 - 21
0.075	22.1	453.3	95.1	4.9	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	37.2	37.2	7.8	92.2	90 - 100
19	74.3	111.5	23.4	76.6	71 - 95
13.2	65.8	177.3	37.2	62.8	56 - 80
4.75	83.90	261.2	54.8	45.2	38 - 54
2.360	79.2	340.4	71.4	28.6	28 - 42
0.300	98.5	438.9	92.0	8.0	7 - 21
0.075	23.4	462.3	96.9	3.1	2 - 8

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For CIVIL AIM CONSULTANTS & ENGINEERS

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22

Date: 04.04.2022

Aggregate Impact Value

Client	**Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**M/S M S V Construction Company, Contractor, Bangalore.**
Name of the Work	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
BIS Code	IS 2386(Part 4):1963
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	04.04.2022

Sl No.	Details	Test No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	384	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84.5	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	297.5	299	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	22.12	22.14	**22.13**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%(MORTH table no.500.16)

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date : 04.04.2022

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**M/S M S V Construction Company, Contractor, Bangalore.**
Name of Work	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Concrete
Date of Testing	04.04.2022

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	11.8	12.4	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	13.2	13.4	
	Combined Flakiness & Elongation index	25.00	25.80	

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Authorised Signatory

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date : 04.04.2022

Aggregate Gradation Test

IS : 2386 Part I

Client	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	M/S M S V Construction Company, Contractor, Bangalore.
Name of the Work	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	04.04.2022

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	415	8.30	8.30	91.70	90 - 100	
9.5	482	9.64	17.94	82.06	70 - 88	
4.75	635	12.70	30.64	69.36	53 - 71	
2.36	682	13.64	44.28	55.72	42 - 58	
1.18	520	10.40	54.68	45.32	34 - 48	
0.600	546	10.92	65.60	34.40	26 - 38	
0.300	489	9.78	75.38	24.62	18 - 28	
0.150	366	7.32	82.70	17.30	12 - 20	
0.075	482	9.64	92.34	7.66	4 - 10	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	420	8.40	8.40	91.60	90 - 100	
9.5	549	10.98	19.38	80.62	70 - 88	
4.75	682	13.64	33.02	66.98	53 - 71	
2.36	533	10.66	43.68	56.32	42 - 58	
1.18	559	11.18	54.86	45.14	34 - 48	
0.600	546	10.92	65.78	34.22	26 - 38	
0.300	682	13.64	79.42	20.58	18 - 28	
0.150	198	3.96	83.38	16.62	12 - 20	
0.075	482	9.64	93.02	6.98	4 - 10	

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date: 04.04.2022

TEST REPORT

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company,** Contractor, Bangalore.
Name of the work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
IS Code	:	IS 73:2013, IS 1203:1978(RA 2008), IS 1205:1978(RA 2009), IS 1208:1978(RA 2009), IS 1209:1978(RA 2009)
Source of location	:	Hot mix Plant, Bangalore, VG 30
Date of testing	:	04.04.2022

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	48	Min 45
2	Softening point, °C	54	Min. 47
3	Ductility at 27°C, cm	> 100	Min. 40
4	Flash Point, °C	272	Min. 220

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22

Date : 06.04.2022

Specific Gravity And Water Absorption Test

Client	**Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**M/S M S V Construction Company, Contractor, Bangalore.**
Name of the Work	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
BIS Code	IS 2386(Part 3):1963
Type of Mix	Bituminous Concrete
Date of Testing	04.04.2022 to 06.04.2022

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2022	2023	2026	
2	Weight of basket suspended in water	W_2 g	753	755	756	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1269	1268	1270	
4	Weight of saturated surface dry aggregate in air	W_3 g	2016	2018	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	747	750	750	
6	Weight of oven dried aggregate	W_4 g	2010	2011	2012	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.691	2.681	2.683	2.685
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.713	2.707	2.712	2.710
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.30%	0.35%	0.40%	0.35%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%(MORTH table 500.16)

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date: 07.04.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company,** Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	07.04.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	10.23	9.54	9 Kn (min)
2	Marshal flow, mm	3.65	2.34	2 – 4
3	Percent air voids in Mineral Aggregate	13.43	14.55	13 – 15
4	Voids in Compacted Mix	3.71	4.5	3 – 6
5	Percent Voids filled with Bitumen	70.4	71..10	65 - 75
6	Density, g/cc	2.23	2.26	--

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22

Date: 07.04.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company,** Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	07.04.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.55	10.82	9 Kn (min)
2	Marshal flow, mm	2.55	2.56	2 – 4
3	Percent air voids in Mineral Aggregate	13.44	14.25	13 – 15
4	Voids in Compacted Mix	3.89	4.51	3 – 6
5	Percent Voids filled with Bitumen	69.33	69.88	65 - 75
6	Density, g/cc	2.21	2.23	--

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22

Date: 08.04.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company,** Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	08.04.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.65	9.85	9 Kn (min)
2	Marshal flow, mm	3.33	2.54	2 – 4
3	Percent air voids in Mineral Aggregate	13.65	14.25	13 – 15
4	Voids in Compacted Mix	3.87	4.61	3 – 6
5	Percent Voids filled with Bitumen	70.21	71.51	65 - 75
6	Density, g/cc	2.25	2.26	--

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22

Date: 08.04.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer**, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company**, Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	08.04.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.48	9.95	9 Kn (min)
2	Marshal flow, mm	3.12	2.97	2 – 4
3	Percent air voids in Mineral Aggregate	13.22	14.35	13 – 15
4	Voids in Compacted Mix	3.63	4.66	3 – 6
5	Percent Voids filled with Bitumen	69.29	68.25	65 - 75
6	Density, g/cc	2.25	2.25	--

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22

Date: 09.04.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company,** Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	09.04.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.67	9.54	9 Kn (min)
2	Marshal flow, mm	3.46	2.58	2 – 4
3	Percent air voids in Mineral Aggregate	13.78	14.45	13 – 15
4	Voids in Compacted Mix	3.12	4.52	3 – 6
5	Percent Voids filled with Bitumen	70.25	71.61	65 - 75
6	Density, g/cc	2.21	2.23	--

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Date: 09.04.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company,** Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	09.04.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.75	10.15	9 Kn (min)
2	Marshal flow, mm	3.25	3.5	2 – 4
3	Percent air voids in Mineral Aggregate	14.1	14.25	13 – 15
4	Voids in Compacted Mix	4.1	4.12	3 – 6
5	Percent Voids filled with Bitumen	67.29	69.12	65 - 75
6	Density, g/cc	2.21	2.24	--

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date: 09.04.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company,** Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	09.04.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	10.25	9.58	9 Kn (min)
2	Marshal flow, mm	3.67	2.45	2 – 4
3	Percent air voids in Mineral Aggregate	13.46	14.52	13 – 15
4	Voids in Compacted Mix	3.78	4.61	3 – 6
5	Percent Voids filled with Bitumen	70.12	71.15	65 - 75
6	Density, g/cc	2.25	2.26	--

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22

Date: 11.04.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company,** Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	11.04.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.44	10.82	9 Kn (min)
2	Marshal flow, mm	2.69	2.65	2 – 4
3	Percent air voids in Mineral Aggregate	13.45	14.52	13 – 15
4	Voids in Compacted Mix	3.84	4.15	3 – 6
5	Percent Voids filled with Bitumen	69.29	70.12	65 - 75
6	Density, g/cc	2.25	2.26	--

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For CIVIL AIM CONSULTANTS & ENGINEERS

Authorised Signatory

No. 01, Satvika Nilaya, Opp. Widia Poorna Prajna School,
Ramaiah Layout, Nagasandra, Bangalore - 560 073.
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CIVIL AIM CONSULTANTS & ENGINEERS

(Building Geo-Tech & Highway Materials Testing Laboratory)

An ISO 9001-2015 Certified Company

NABL Accredited As Per ISO/IEC 17025:2017 Laboratory

Job No.: CACE/BBMP/MSV/W.No.14/2021-22

Date: 11.04.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company,** Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	11.04.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.63	10.87	9 Kn (min)
2	Marshal flow, mm	2.79	2.96	2 – 4
3	Percent air voids in Mineral Aggregate	13.62	14.57	13 – 15
4	Voids in Compacted Mix	3.83	4.20	3 – 6
5	Percent Voids filled with Bitumen	69.43	70.17	65 - 75
6	Density, g/cc	2.25	2.26	--

Note:

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⇒ The results indicated above are based on the tests carried out on the samples collected at the site.

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date: 11.04.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	M/S **M S V Construction Company,** Contractor, Bangalore.
Name of the Work	:	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	11.04.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	10.55	9.91	9 Kn (min)
2	Marshal flow, mm	2.81	3.25	2 – 4
3	Percent air voids in Mineral Aggregate	13.88	14.12	13 – 15
4	Voids in Compacted Mix	4.12	3.25	3 – 6
5	Percent Voids filled with Bitumen	70.81	68.93	65 - 75
6	Density, g/cc	2.25	2.26	--

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date : 07.04.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	M/S M S V Construction Company, Contractor, Bangalore.
NAME OF THE WORK	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	07.04.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	473	473
3. Weight of Asphalt and Mineral matter Extracted, g	27	27
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	27	27
7. Bitumen content in %	5.40	5.40
8. Average	5.40	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	13.8	13.8	2.9	97.1	90 - 100
9.5	65.8	79.6	16.8	83.2	70 - 88
4.75	90.3	169.9	35.9	64.1	53 - 71
2.36	46.2	216.1	45.7	54.3	42 - 58
1.18	35.8	251.9	53.3	46.7	34 - 48
0.600	55.3	307.2	64.9	35.1	26 - 38
0.300	42.8	350	74.0	26.0	18 - 28
0.150	34.9	384.9	81.4	18.6	12 - 20
0.075	42.8	427.7	90.4	9.6	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.9	14.9	3.2	96.8	90 - 100
9.5	66.2	81.1	17.1	82.9	70 - 88
4.75	92.8	173.9	36.8	63.2	53 - 71
2.36	45.3	219.2	46.3	53.7	42 - 58
1.18	48.2	267.4	56.5	43.5	34 - 48
0.600	56.3	323.7	68.4	31.6	26 - 38
0.300	45.8	369.5	78.1	21.9	18 - 28
0.150	37.9	407.4	86.1	13.9	12 - 20
0.075	32.6	440	93.0	7.0	4 - 10

For CIVIL AIM CONSULTANTS & ENGINEERS

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date : 07.04.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	M/S M S V Construction Company, Contractor, Bangalore.
NAME OF THE WORK	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	07.04.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472.5	472
3. Weight of Asphalt and Mineral matter Extracted, g	27.5	28
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	27.5	28
7. Bitumen content in %	5.50	5.60
8. Average	5.55	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	12.2	12.2	2.6	97.4	90 - 100
9.5	68.9	81.1	17.2	82.8	70 - 88
4.75	92.6	173.7	36.8	63.2	53 - 71
2.36	42.5	216.2	45.8	54.2	42 - 58
1.18	36.8	253	53.5	46.5	34 - 48
0.600	50.9	303.9	64.3	35.7	26 - 38
0.300	46.3	350.2	74.1	25.9	18 - 28
0.150	35.8	386	81.7	18.3	12 - 20
0.075	46.9	432.9	91.6	8.4	4 - 10

SIEVE SIZE mm	Test 2				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	14.5	14.5	3.1	96.9	90 - 100
9.5	62.8	77.3	16.4	83.6	70 - 88
4.75	90.9	168.2	35.6	64.4	53 - 71
2.36	46.5	214.7	45.5	54.5	42 - 58
1.18	43.8	258.5	54.8	45.2	34 - 48
0.600	52.4	310.9	65.9	34.1	26 - 38
0.300	49.3	360.2	76.3	23.7	18 - 28
0.150	35.6	395.8	83.9	16.1	12 - 20
0.075	40.8	436.6	92.5	7.5	4 - 10

For CIVIL AIM CONSULTANTS & ENGINEERS

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date : 08.04.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	M/S M S V Construction Company, Contractor, Bangalore.
NAME OF THE WORK	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	08.04.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472	473
3. Weight of Asphalt and Mineral matter Extracted, g	28	27
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	28	27
7. Bitumen content in %	5.60	5.40
8. Average	5.50	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	13.9	13.9	2.9	97.1	90 - 100
9.5	65.6	79.5	16.8	83.2	70 - 88
4.75	90.5	170	36.0	64.0	53 - 71
2.36	46.5	216.5	45.9	54.1	42 - 58
1.18	36	252.5	53.5	46.5	34 - 48
0.600	55.9	308.4	65.3	34.7	26 - 38
0.300	43	351.4	74.4	25.6	18 - 28
0.150	35.1	386.5	81.9	18.1	12 - 20
0.075	43.1	429.6	91.0	9.0	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	15.1	15.1	3.2	96.8	90 - 100
9.5	66	81.1	17.1	82.9	70 - 88
4.75	92.6	173.7	36.7	63.3	53 - 71
2.36	45.1	218.8	46.3	53.7	42 - 58
1.18	48.1	266.9	56.4	43.6	34 - 48
0.600	56.1	323	68.3	31.7	26 - 38
0.300	45.6	368.6	77.9	22.1	18 - 28
0.150	38.5	407.1	86.1	13.9	12 - 20
0.075	31.6	438.7	92.7	7.3	4 - 10

For CIVIL AIM CONSULTANTS & ENGINEERS

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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	M/S M S V Construction Company, Contractor, Bangalore.
NAME OF THE WORK	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	08.04.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472	472
3. Weight of Asphalt and Mineral matter Extracted, g	28	28
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	28	28
7. Bitumen content in %	5.60	5.60
8. Average	5.60	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	13.1	13.1	2.8	97.2	90 - 100
9.5	69.1	82.2	17.4	82.6	70 - 88
4.75	92.1	174.3	36.9	63.1	53 - 71
2.36	42.2	216.5	45.9	54.1	42 - 58
1.18	37	253.5	53.7	46.3	34 - 48
0.600	51.1	304.6	64.5	35.5	26 - 38
0.300	46.5	351.1	74.4	25.6	18 - 28
0.150	35.1	386.2	81.8	18.2	12 - 20
0.075	47.1	433.3	91.8	8.2	4 - 10

SIEVE SIZE mm	Test 2				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	14.3	14.3	3.0	97.0	90 - 100
9.5	62.5	76.8	16.3	83.7	70 - 88
4.75	91.1	167.9	35.6	64.4	53 - 71
2.36	46.7	214.6	45.5	54.5	42 - 58
1.18	43.5	258.1	54.7	45.3	34 - 48
0.600	52.1	310.2	65.7	34.3	26 - 38
0.300	49.1	359.3	76.1	23.9	18 - 28
0.150	35.2	394.5	83.6	16.4	12 - 20
0.075	40.5	435	92.2	7.8	4 - 10

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date : 09.04.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	M/S M S V Construction Company, Contractor, Bangalore.
NAME OF THE WORK	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	09.04.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472.5	473
3. Weight of Asphalt and Mineral matter Extracted, g	27.5	27
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	27.5	27
7. Bitumen content in %	5.50	5.40
8. Average	5.45	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.2	14.2	3.0	97.0	90 - 100
9.5	66.2	80.4	17.0	83.0	70 - 88
4.75	91.3	171.7	36.3	63.7	53 - 71
2.36	45.9	217.6	46.1	53.9	42 - 58
1.18	36.1	253.7	53.7	46.3	34 - 48
0.600	55.9	309.6	65.5	34.5	26 - 38
0.300	43.1	352.7	74.6	25.4	18 - 28
0.150	35.1	387.8	82.1	17.9	12 - 20
0.075	41.5	429.3	90.9	9.1	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.5	14.5	3.1	96.9	90 - 100
9.5	65.9	80.4	17.0	83.0	70 - 88
4.75	92.5	172.9	36.6	63.4	53 - 71
2.36	45.9	218.8	46.3	53.7	42 - 58
1.18	48.9	267.7	56.6	43.4	34 - 48
0.600	56.9	324.6	68.6	31.4	26 - 38
0.300	47.1	371.7	78.6	21.4	18 - 28
0.150	38.1	409.8	86.6	13.4	12 - 20
0.075	31.5	441.3	93.3	6.7	4 - 10

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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	**M/S M S V Construction Company, Contractor, Bangalore.**
NAME OF THE WORK	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	09.04.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472.5	472.5
3. Weight of Asphalt and Mineral matter Extracted, g	27.5	27.5
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	27.5	27.5
7. Bitumen content in %	5.50	5.50
8. Average	5.50	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	15.2	15.2	3.2	96.8	90 - 100
9.5	69.1	84.3	17.8	82.2	70 - 88
4.75	92.2	176.5	37.4	62.6	53 - 71
2.36	42.2	218.7	46.3	53.7	42 - 58
1.18	36.6	255.3	54.0	46.0	34 - 48
0.600	50	305.3	64.6	35.4	26 - 38
0.300	46.6	351.9	74.5	25.5	18 - 28
0.150	35.5	387.4	82.0	18.0	12 - 20
0.075	46.5	433.9	91.8	8.2	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.7	14.7	3.1	96.9	90 - 100
9.5	62.2	76.9	16.3	83.7	70 - 88
4.75	89.9	166.8	35.3	64.7	53 - 71
2.36	46.5	213.3	45.1	54.9	42 - 58
1.18	43.5	256.8	54.3	45.7	34 - 48
0.600	52.2	309	65.4	34.6	26 - 38
0.300	49.9	358.9	76.0	24.0	18 - 28
0.150	35.5	394.4	83.5	16.5	12 - 20
0.075	40.2	434.6	92.0	8.0	4 - 10

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Authorised Signatory

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CIVIL AIM CONSULTANTS & ENGINEERS
(Building Geo-Tech & Highway Materials Testing Laboratory)
An ISO 9001-2015 Certified Company
NABL Accredited As Per ISO/IEC 17025:2017 Laboratory

Job No.: CACE/BBMP/MSV/W.No.14/2021-22

Date : 09.04.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	M/S M S V Construction Company, Contractor, Bangalore.
NAME OF THE WORK	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	09.04.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472.5	473
3. Weight of Asphalt and Mineral matter Extracted, g	27.5	27
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	27.5	27
7. Bitumen content in %	5.50	5.40
8. Average	5.45	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	16.3	16.3	3.4	96.6	90 - 100
9.5	64.9	81.2	17.2	82.8	70 - 88
4.75	91.3	172.5	36.5	63.5	53 - 71
2.36	48.2	220.7	46.7	53.3	42 - 58
1.18	36.8	257.5	54.5	45.5	34 - 48
0.600	57.6	315.1	66.7	33.3	26 - 38
0.300	43.3	358.4	75.9	24.1	18 - 28
0.150	35.9	394.3	83.4	16.6	12 - 20
0.075	40.1	434.4	91.9	8.1	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	17.1	17.1	3.6	96.4	90 - 100
9.5	65.2	82.3	17.4	82.6	70 - 88
4.75	92.1	174.4	36.9	63.1	53 - 71
2.36	45.1	219.5	46.4	53.6	42 - 58
1.18	48.9	268.4	56.7	43.3	34 - 48
0.600	56	324.4	68.6	31.4	26 - 38
0.300	44.8	369.2	78.1	21.9	18 - 28
0.150	37.1	406.3	85.9	14.1	12 - 20
0.075	31.6	437.9	92.6	7.4	4 - 10

For CIVIL AIM CONSULTANTS & ENGINEERS

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Job No.: CACE/BBMP/MSV/W.No.14/2021-22 Date : 11.04.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	M/S M S V Construction Company, Contractor, Bangalore.
NAME OF THE WORK	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	11.04.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472	472.5
3. Weight of Asphalt and Mineral matter Extracted, g	28	27.5
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	28	27.5
7. Bitumen content in %	5.60	5.50
8. Average	5.55	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	15.9	15.9	3.4	96.6	90 - 100
9.5	66.6	82.5	17.5	82.5	70 - 88
4.75	92.2	174.7	37.0	63.0	53 - 71
2.36	42.9	217.6	46.1	53.9	42 - 58
1.18	37.5	255.1	54.0	46.0	34 - 48
0.600	51.9	307	65.0	35.0	26 - 38
0.300	46.6	353.6	74.9	25.1	18 - 28
0.150	35.5	389.1	82.4	17.6	12 - 20
0.075	46.6	435.7	92.3	7.7	4 - 10

SIEVE SIZE mm	Test 2				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	14.7	14.7	3.1	96.9	90 - 100
9.5	62.1	76.8	16.3	83.7	70 - 88
4.75	91.9	168.7	35.7	64.3	53 - 71
2.36	46	214.7	45.4	54.6	42 - 58
1.18	43.1	257.8	54.6	45.4	34 - 48
0.600	51.1	308.9	65.4	34.6	26 - 38
0.300	48.1	357	75.6	24.4	18 - 28
0.150	34.6	391.6	82.6	17.1	12 - 20
0.075	41.8	433.4	91.7	8.3	4 - 10

For CIVIL AIM CONSULTANTS & ENGINEERS

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Date : 11.04.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	M/S M S V Construction Company, Contractor, Bangalore.
NAME OF THE WORK	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	11.04.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472	472
3. Weight of Asphalt and Mineral matter Extracted, g	28	28
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	28	28
7. Bitumen content in %	5.60	5.60
8. Average	5.60	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.6	14.6	3.1	96.9	90 - 100
9.5	66.3	80.9	17.1	82.9	70 - 88
4.75	89.4	170.3	36.1	63.9	53 - 71
2.36	45	215.3	45.6	54.4	42 - 58
1.18	35.8	251.1	53.2	46.8	34 - 48
0.600	54.3	305.4	64.7	35.3	26 - 38
0.300	41.8	347.2	73.6	26.4	18 - 28
0.150	35.3	382.5	81.0	19.0	12 - 20
0.075	41.2	423.7	89.8	10.2	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.9	14.9	3.2	96.8	90 - 100
9.5	66.2	81.1	17.2	82.8	70 - 88
4.75	92.8	173.9	36.8	63.2	53 - 71
2.36	45.3	219.2	46.4	53.6	42 - 58
1.18	48.2	267.4	56.7	43.3	34 - 48
0.600	56.3	323.7	68.6	31.4	26 - 38
0.300	45.8	369.5	78.3	21.7	18 - 28
0.150	37.9	407.4	86.3	13.7	12 - 20
0.075	32.6	440	93.2	6.8	4 - 10

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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	M/S M S V Construction Company, Contractor, Bangalore.
NAME OF THE WORK	Entrustment of work "Asphalting to roads at Ashok nagar and Surrounding area in ward no.14 Bagalagunte," BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	11.04.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472.5	472
3. Weight of Asphalt and Mineral matter Extracted, g	27.5	28
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	27.5	28
7. Bitumen content in %	5.50	5.60
8. Average	5.55	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	14	14	3.0	97.0	90 - 100
9.5	69.3	83.3	17.6	82.4	70 - 88
4.75	93.9	177.2	37.5	62.5	53 - 71
2.36	43.5	220.7	46.7	53.3	42 - 58
1.18	38.2	258.9	54.8	45.2	34 - 48
0.600	39.2	298.1	63.1	36.9	26 - 38
0.300	46.3	344.4	72.9	27.1	18 - 28
0.150	36.2	380.6	80.6	19.4	12 - 20
0.075	46.9	427.5	90.5	9.5	4 - 10

SIEVE SIZE mm	Test 2				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	14.6	14.6	3.1	96.9	90 - 100
9.5	61.8	76.4	16.2	83.8	70 - 88
4.75	91.1	167.5	35.5	64.5	53 - 71
2.36	46.3	213.8	45.3	54.7	42 - 58
1.18	43.1	256.9	54.4	45.6	34 - 48
0.600	52.1	309	65.5	34.5	26 - 38
0.300	49.8	358.8	76.0	24.0	18 - 28
0.150	35.8	394.6	83.6	16.4	12 - 20
0.075	40.2	434.8	92.1	7.9	4 - 10

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